Input parameters in the models

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Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

Input parameters in the models

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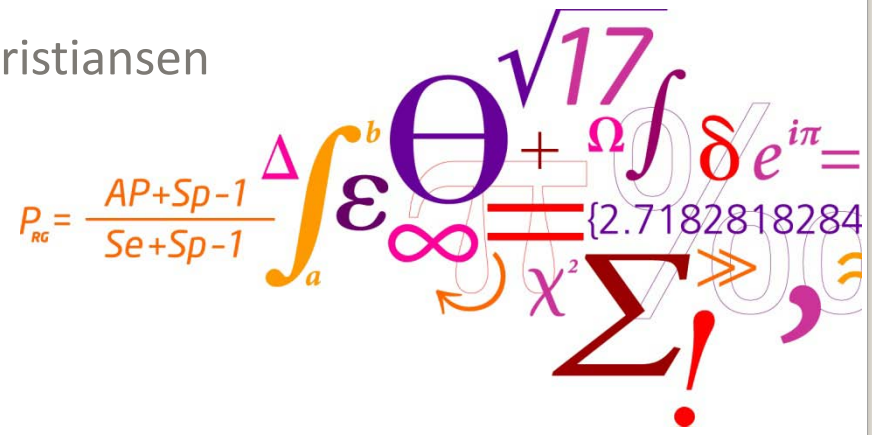

DTU Vet
National Veterinary Institute

History

- Start with one infected herd (index herd)

History

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- Day1 – Infected

History

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- Day1 – Infected
- Day5 – Showing clinical signs

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- Start with one infected herd (index herd)
- Day1 – Infected
- Day5 – Showing clinical signs
- Day21 – Detected

History

- Start with one infected herd (index herd)
- Day1 – Infected
- Day5 – Showing clinical signs
- Day21 – Detected

- Index species (cattle, pigs, sheep and goats)
- Densely and sparsely populated areas

Movements and contacts

	High risk	Medium risk	Low risk
Including	Animals	Veterinarians	Visitors
		Art. Insimin.	Rendering
		Milk control	Feed trucks
			Milk tanks*
			Abattoir trucks*
Frequency	Herd based	Based on herd type	Based on herd type
Movement distance	Based on herd type	Same for all herds	Based on herd type
P(trans)	0.95 (0.9-1)	0.5 (0.1-0.9)	0.175 (0.05-0.35)
swine	0.95 (0.9-1)	0.2 (0.05-0.9)	0.1 (0.05-0.35)

Markets

- Cattle only
  - To
  - From
- Probability of transmission (PoT)
  - Norm. (mean=0.415, sd=0.06)
- Only until day 21
  - all markets are closed at the day of first detection

Local spread

- Within 3 km
- High risk within 100 meters
  - To create spread between different species on same farm
- 1000 meters 0.012
- 2000 meters 0.004
- 3000 meters 0.001

Surveillance

- Basic surveillance
  - Is the farmers' and vets' daily surveillance of the herd
  - 80% of the swine herds and milking herds
  - 30% of the sheep herds and not-milking herds
- Protection zone (3 km)
  - All herds visited twice!
  - Visited day 5 days (3-7) after creation of the zone
  - Again 21 days later

Surveillance

- Surveillance zone (10 km)
  - All herds visited once
  - Visited day 5 (3-7) days after creation of the zone
- Testing sheep – zones and traced
  - All herds tested 21days after creation of zone
  - 98% chance of detecting disease

Movement restrictions

- Stand still for 3 days
  - All animal movements including animals for slaughter
  - Not persons
- Movements from zones and within zones
  - Animals 0.98
  - Indirect medium 0.7
  - Indirect low 0.3

Tracing

- Animals – (forward)
  - within 0-2 days
  - Prob. forgotten 0.01
  - Depopulated
- Animals – (backwards)
  - within 0-2 days
  - Prob. forgotten 0.01
  - Surveilled
  - 98% chance of being surv.
- Indirect medium
  - within 0-2 days
  - Prob. forgotten 0. 5
  - 80% chance of being surv.
- Indirect low
  - within 1-4 days
  - Prob. forgotten 0. 5
  - 50% chance of being surv.

Depopulation

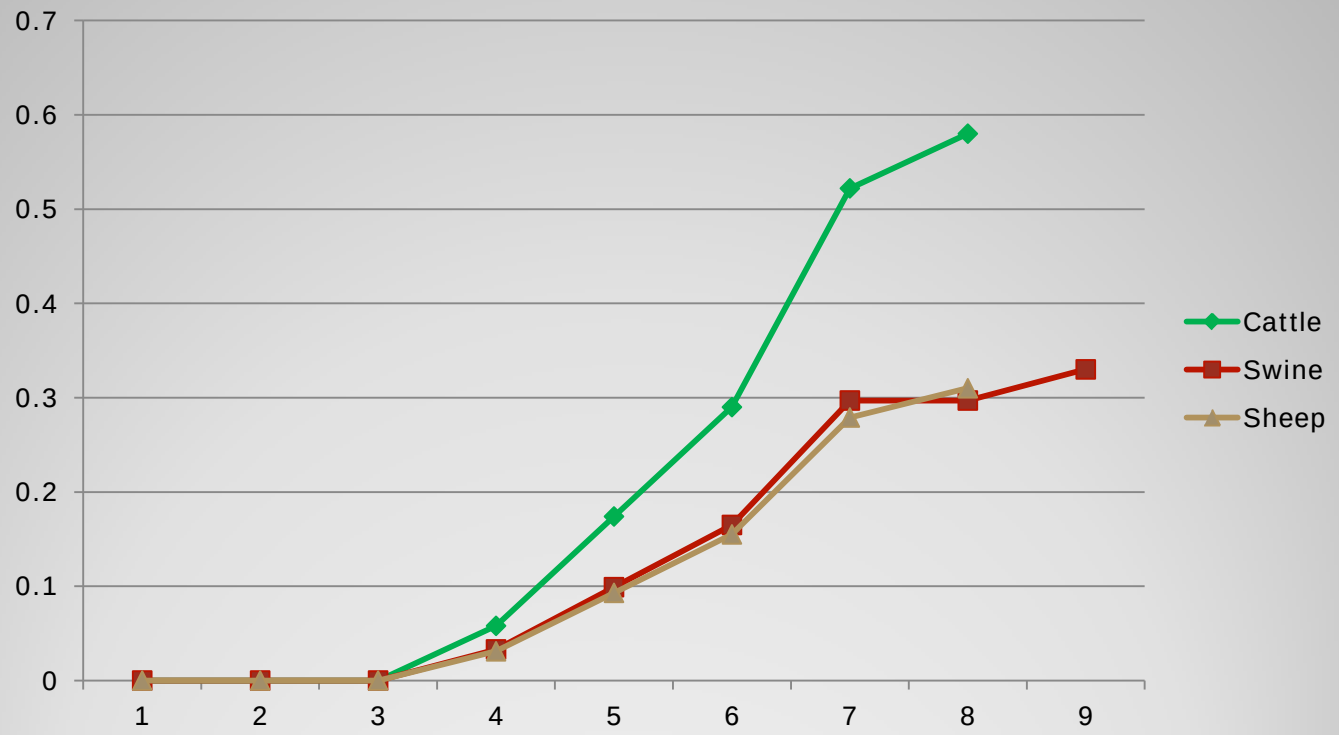
- Detected herds (1st priority) - tested
- Traced animal movements (2nd priority)
  - (forwards)
  - Tracing period – 14 days
  - Earlier movements – surveilled – tested

Resources

- Depopulation
  - 2000 ruminants
  - 4800 swine
- Vaccination
  - 50,000 ruminants
  - 60,000 swine

Vaccination

- Vaccine efficacy



Economy

Economy – direct costs

- Surveillance
- Depopulation
- Cleaning & desinfection
- Empty stables
- Compensations
- Welfare slaughter
- National stand still
- Vaccination

Economy – export losses

- EU
- Non-EU

- Live animals
- Animal products

Economy – direct costs

- **Surveillance**
  - Visits in surveyed herds
    - Different for different herd category
  - Sheep
    - +sampling and serological analyses

Economy – direct costs

- Surveillance
- **Depopulation**
  - Logistics
  - Testing
  - Destruction

Economy – direct costs

- Surveillance
- Depopulation
- **Cleaning+desinfection**
- Empty stables
- Compensations
- Welfare slaughter
- National stand still
- vaccination

Economy – direct costs

- Surveillance
- Depopulation
- Cleaning+desinfection
- **Empty stables**
  - Days within zones after depop
  - VacToKill
    - Days within zones from depop to end of outbreak

Economy – direct costs

- Surveillance
- Depopulation
- Cleaning+desinfection
- Empty stables
- **Compensations**
- Welfare slaughter
- National stand still
- vaccination

Economy – direct costs

- Surveillance
- Depopulation
- Cleaning+desinfection
- Empty stables
- Compensations
- **Welfare slaughter**
  - Only swine herds

Economy – direct costs

- Surveillance
- Depopulation
- Cleaning+desinfection
- Empty stables
- Compensations
- Welfare slaughter
- **National stand still**
  - Pert dist. €5 (4-7) x 10^6

Economy – direct costs

- Surveillance
- Depopulation
- Cleaning+desinfection
- Empty stables
- Compensations
- Welfare slaughter
- National stand still
- **Vaccination**
  - Vaccine application
  - Testing

Economy - Export losses

- Pigs & pork
  - Live pigs to EU
  - Pig products to EU
  - Pigs and pig products to Non-EU

Economy - Export losses

- Pigs & pork
  - Live pig til EU
  - Pig products to EU
  - Pigs and pig products to Non-EU
    - Assumed sold on EU market with 25% price reduction

Economy - Export losses, swine

Obtain export after EPI	Depop	VacToKill	VacToLive
Non-EU	**3 month** after last culled herds + 2 (1-3) month	**3 month** after last culled herds (whether last cull is infected or vaccinated) + 2 (1-3) month	**6 month** after last culled herds + 2 (1-3) month
EU (affected zones only)	Until lifting of zones		

Economy - Export losses, cattle

Obtain export after EPI	Depop	VacToKill	VacToLive
Fresh milk and Danablue	**6 months** after last culled herds + 2 (1-3) months		
Other milk prod.	**4 months** after last culled herds + 2 (1-3) months		